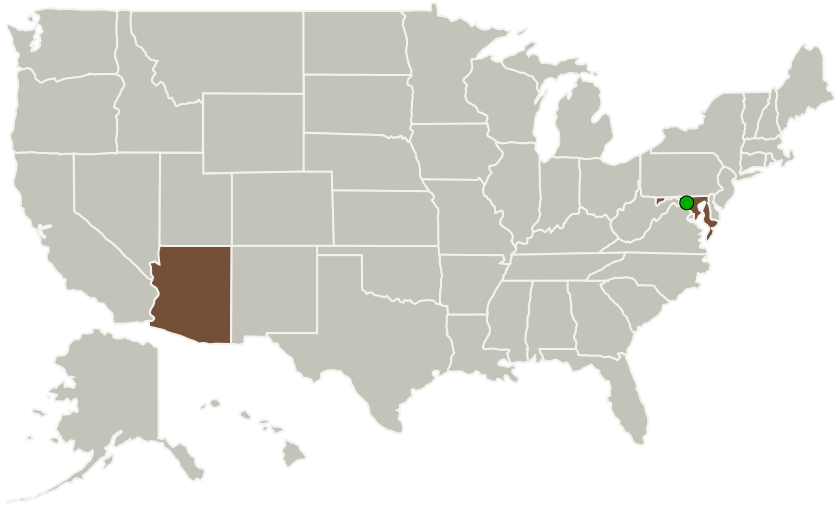
# Unconditionally Stable Low Dropout Regulators for Extreme Environments, Phase I

Completed Technology Project (2010 - 2010)

## Project Introduction

We have developed a fully integrated LDO regulator using a patented transistor technology that can be manufactured in high volume commercial semiconductor foundries with no changes to the process flow. The regulator is stable under all load conditions without the need for an external compensation capacitor thereby reducing the mass/volume of the power management system and increasing reliability. The existing LDO component has very competitive figures of merit (dropout voltage, transient response, power supply rejection) compared to existing components targeting commercial consumer electronics. The work we are proposing for this Phase 1 activity will confirm the expected wide temperature range operation (-180C to +150C) and radiation tolerance (200krads(Si) to 1 Mrad(Si)) of the existing component. Based on these measurements we shall design, simulate and layout LDO regulators for nominal load currents of 100 mA and 1A for fabrication at two rad-hard CMOS foundries during a follow-on Phase 2 activity. The LDO regulators will be designed as drop-in replacements for many existing components. They can also be integrated directly on chip as part of an application specific integrated circuit thereby reducing the chip count still further.

## Primary U.S. Work Locations and Key Partners

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## Table of Contents

**Small Business Innovation Research/Small Business Tech Transfer**

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| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| SJT Micropower | Lead Organization | Industry | Fountain Hills, Arizona |
| Goddard Space Flight Center(GSFC) | Supporting Organization | NASA Center | Greenbelt, Maryland |

| Primary U.S. Work Locations | |
|---|---|
| Arizona | Maryland |

## Project Transitions

**January 2010:** Project Start

**July 2010:** Closed out

**Closeout Documentation:**

- Final Summary Chart*(https://techport.nasa.gov/file/140062)*

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

SJT Micropower

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

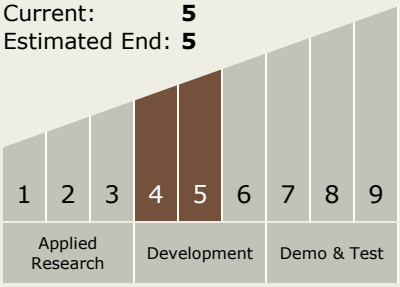
Carlos Torrez

**Principal Investigator:**

Seth Wilk

## Technology Maturity (TRL)

Start: **4**
Current: **5**
Estimated End: **5**



# Unconditionally Stable Low Dropout Regulators for Extreme Environments, Phase I

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## Technology Areas

**Primary:**

- TX10 Autonomous Systems
  - TX10.1 Situational and Self Awareness
    - TX10.1.4 Hazard Assessment

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System